American Foundryman

AMERICAN · FOUNDRYMEN'S ASSOCIATION
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...VITIES

July
1939

A. F. A. on the West Coast

A.F.A. on the West Coast is a reality and not a dream. We have members in practically every industrial community from San Diego in the extreme south to Vancouver, British Columbia, in the north, a distance of over two thousand miles, and in the near future we expect to have members in Alaska in the far north as well.

To us who are connected with the foundry business and live in the formerly so-called "Wild and Woolly" West, the A.F.A. gives us the feeling that we really are part of a great industry and makes us more conscious of the fact that there is a great deal which must be done to keep our foundry industry abreast of the times.

Many industrial developments have been made in the West, for the spirit of the pioneer is still with us, however, as a rule these developments are attracted eastward nearer the center of population. This trend is changing and we can look forward to greater permanent industrial development in the West as the design of machinery becomes lighter and the population in the West increases, which means more members for A.F.A.

We have two live A.F.A. Chapters in California, the first being established in San Francisco and the second in Los Angeles. Memberships in these two chapters cover the entire state and joint meetings are held once a year at Fresno, located about half-way between San Francisco and Los Angeles, which cities are about four hundred and fifty miles apart.

The art of founding has played a vital part in the development of the West and is a most romantic history in itself, which someone should record for posterity.

A.F.A. Day at the Golden Gate International Exposition will be celebrated on September the ninth and we invite all foundrymen to join with us on this great day which is the anniversary of California's admission into the U. S. A. as a State.

Chas. Hoehn

C. J. P. Hoehn,
Director, A.F.A.

Mr. Hoehn represents the west coast members on the A.F.A. Board of Directors. He is president, Enterprise Foundry Corporation of San Francisco, a company operating gray iron and steel foundries. He is a past president of the Pacific Coast Founders' Association and of the Manufacturers' Association of South San Francisco. Mr. Hoehn was instrumental in organizing the first A.F.A. chapter on the west coast, the Northern California Chapter, and served as its first chairman.

American Foundryman

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July, 1939

Volume I — Number 13

Published by the American Foundrymen's Association, Inc., 222 West Adams St., Chicago, Ill., for the purpose of presenting Association and Chapter activities. Published monthly. Subscription price $1.00 per year. Single copies, 10c.

Entered as second class matter July 22, 1938, at the post office at Chicago, Illinois, under the Act of March 3, 1879.

Molding Equipment for the Miscellaneous, Production Foundry

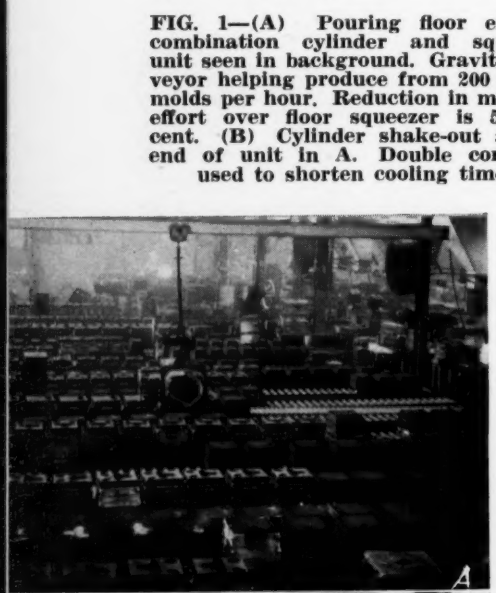
By W. R. Jennings,* Waterloo, Iowa

This paper was presented before the Materials Handling session of the 43rd Annual Convention, Cincinnati, O., May 15-18. The author, W. R. Jennings, is foundry superintendent of the John Deere Tractor Co., Waterloo, Iowa. The author discusses molding equipment from the viewpoint of the foundry executive. The value of sand control, equipment mantenance, sand slinger units, and jolt squeeze units is described in detail. In equipping a foundry on a modern production basis the author cautions against over-equipping as against under-equipping.

THE foundry industry, that of casting metals, is several thousand years old; yet the industry as we see it today, dates back not to the creation of the pyramids of Egypt, but to the birth of the automobile. Producing castings in quantity, accurate, and of a definite quality, is an industry still young. Dr. Moldenke and others foresaw the need of today's foundry *"Control"*; they were the pioneers. The tools for today's modern foundries have been created by men still young and our industry is young, vigorous, and changing.

Our problem today is to make castings cheaply, accurately, and of a definite engineering quality. The answer is equipment and control. Accurate castings could be made with highly skilled workmen where molding price is not the deciding factor. However, to maintain the American standard of high wages, better quality, and lower price, we must produce in quantity.

FIG. 1—(A) Pouring floor end of combination cylinder and squeezer unit seen in background. Gravity conveyor helping produce from 200 to 350 molds per hour. Reduction in molding effort over floor squeezer is 53 per cent. (B) Cylinder shake-out at far end of unit in A. Double conveyor used to shorten cooling time.



A

B

Sand Control

In order to produce in quantity, we must be certain of the materials to be used. The feel of the sand is no longer a sufficient indication of quality. Too much is at stake. For example—some two years ago, we changed our facing sand from a heap and new sand combination to one entirely of reclaimed burnt core sand. At 3 per cent moisture this core sand facing felt heavy and wet comparable to 6 to 7 per cent moisture in the old sand. At 2½ per cent moisture this new sand felt too dry to the old timers because it would run through their fiingers; yet this was the way it was to be used. On one unit the sand was changed to a finer grade in order to produce smoother castings. However, it was found that the casting still had a very rough surface. In analyzing the cause of the defect it was found that though the sand felt finer than that previously used, too many of the fines had been taken out which caused the permeability to be too high; laboratory control immediately detected this; thus showing the rule of thumb is dead. Laboratory control and analysis is substituted in its stead.

Without this sand control, our present day molding equipment is apt to be inefficient. Post mortems in the foundry are useful. We can all pass by the remains and make our usual comment such as, sand too heavy, cores green, ram away, etc., but how much better to see our creation stepping down the line as a new automobile, tractor, refrigerator or what not, and the answer is to know in advance the cause of these industrial accidents. Sand must have a certain range of grain size, bond, moisture, permeability and flowability, green strength, and dry strength to do the job right, and this involves control, test, and check in advance of delivery to the molders.

In unit systems we have mullers, mixers, aereators and fines control units to maintain set standards. On slinger, squeezer, and production molding machine floors this generally is a more difficult job, because the addition of new materials rather than conditioning of old materials is depended on to maintain our standard. Certainly sand cutters, aereators, etc., are better than the old shovel. However, the only fines control we have is the amount we can kick up in the atmosphere; unless, of course, we are in position to move our floors to a central conditioning unit. There is room for development in this line. Machines are made that will clean up the gangway and sweep the dust off the rafters, but why is the dust there? Some of this is good material. In our plant there is a unit making heavy castings on which a fairly high permeability is maintained. The fines removed from the unit and collected in a dry collector were analyzed and tested. The test result found the collected fines to be high in binding materials. These fines are added to another unit to reduce permeability and add bond. Are your collectors taking off valuable materials that might be reused?

Equipment Maintenance

The next item after control of sand, but not less important from production viewpoint is machine and unit maintenance. Systematic inspection, lubrication and fixed responsibility are necessary to avoid delays. If records are kept of your equipment, these standards can be readily set up. If not, a manufacturer's recommendation can generally be followed. You will find dividends in avoiding delays. Don't let your maintenance department become a repair department.

Each piece of equipment is scheduled to make so many pieces per 8-hour day. Under the Wages and Hours act you are privileged to pay time and a half for overtime; but can you? Let's assume a plant has scheduled 100 molds at 8 cents per mold for an 8-hour day and through delays only gets 90 molds. One hundred molds at 8 cents would cost $8 for labor. Assuming 200 per cent overhead, a cost of $24 per 100 disregarding other factors is arrived at. Now 90 molds at 8 cents gives $7.20 while the overhead went on just the same. We have a cost of $7.20, plus $16 or $23.20 for 90 molds or $2.56 each or $25.60 per 100 units. Can you pass this on to your customer? Or let's decide to make up these 10 molds with the additional overtime. We have 90 molds at 8 cents each or $7.20. Ten molds at 12 cents each or $8.40 per 100 molds. A 5 per cent increase on the entire production for the day because of the 1-hour delay. Can you pass this on? Maintenance is a vital part of your foundry.

FIG. 2—(A) Gravity conveyors making use of transfer car thus allowing two lines of conveyors for pouring and cooling. (B) Gravity unit with portable by-pass for admitting core backs and two sets of molding machines. This arrangement prevents first set of machines from being stymied by second set.

Patterns

Patterns are an integral part of molding equipment. They are generally made of wood or composition for short runs, aluminum and magnesium alloys for medium production, and cast iron and alloys for heavy production. Patterns can be obtained accurate to drawing. Shrinkage allowance is determined by the metal to be made in the foundry. There is no longer an excuse for a good looking pattern having a slight back draft on one spot and the reverse on some other spot. Patterns are better judged by their actions. Poorly made patterns went out with the slick and trowel in modern production shops. Some pattern shops maintain a good business, others failed to notice the change in the foundries and thereby caused manufacturers to put in their own shops. Foundries have been able to change their molding methods with the advent and insistence on more accurate patterns.

Molding Equipment

With proper patterns and sand, we come to the choice of where and how a job should be made. One large manufacturer makes all cylinder blocks on a sand slinger, another makes all on molding machines. There cannot be a wide spread in cost of production or this condition would not exist. One answer to this problem is in the service given the molders.

What equipment should we use, and why? In the development of molding machine technique two normal lines have been followed in our mechanical development. The hand jarring and hand ramming of a mold has been converted into mechanical jar and mechanical squeeze. Second, the filling of deep pockets by the natural method of throwing a handful of sand has been converted into a sandslinger. Other methods have been tried not so successfully as these two methods which are developments of

FIG. 3—Illustrating miscellaneous cylinders made on a unit.

a normal way of doing a job. The rollover, of course, has been accomplished by air rollover or by trunion and hoist methods. We are concerned here principally with molding methods. Which of these two methods is the best to follow? It is my personal experience that you can obtain satisfactory molding by either of these two methods. When should one use sand slingers and when molding machines? That is probably better answered by a specific problem as presented in your shop. For illustration, some

FIG. 4—Flask in which three different types of cylinders can be made. Note drop-plate and side rail mountings.

typical examples of production which we are able to obtain from this type of equipment will be given.

Do not translate the figure which will be given into your shop because no two foundries have the same conditions. However, it may serve as a measuring standard. If a job which will require a two-man lift gives a production in the 400 class, you are doing a good job. By the 400 class is meant that molding equipment is considered from

FIG. 5—Pulley mold made in green sand with exception of center core. Note lower half of drag is solid flask.

the molding end only and core setting, clamping, shakeout, etc., is omitted from consideration. If two men are on the drag and two men on the cope and the mold average per man per hour is fifteen, this unit is considered in the 400 class.

Sand Slinger

Present-day molding machines are able to do this and better—whether this result is obtained or not is due entirely to the service given these four men. The sandslinger likewise can ram from 10 to 18 cu. ft. per min., but again if you get in this 400 class it will depend on the service given the operator and his four or five helpers on the molding end.

For an example, take a flask 24 in. square, 8 in. drag and 8 in. cope. On a sandslinger unit we have six men classed as molding crew, one slinger operator, two flask men, one strike-off man and two lift-off men. These men have produced better than 700 molds of this type in 8 hrs. Seven hundred molds divided by six men, again by 8 hrs., gives 14+ or not quite 15 molds per man hour. Similar job results can be had on a machine molding unit having four men in the molding cycle regardless of core setting difficulties or any other problem. That is two drag and two cope men, with a production of 460 molds in 8 hours. Again 460 divided by 4 and by 8 gives 14+ molds per man hour. We believe that depending upon the service we give the men directly on the molding end, that 10 to 15 molds per man hour is good production. We have jobs that are interchangeable on slinger and jolting machines that give equally good results in regard to scrap, etc.

In equipping for medium sized sandslinger or molding machine work, there is much dissension on which type of equipment is most economical for your plant conditions. An unbiased opinion could only be expressed by a study of your shop conditions. However, in the larger class of work where flasks must be handled by heavy cranes we believe the sandslinger is in a class by itself. Before the advent of the sandslinger many jobs were made on heavy jolt rollover equipment, in fact a good many are still made today in this manner. However, it may be the question of bringing the slinger to the job or the job to the jolt machine which will determine the economics of your problem.

Mold Hardness

What are the characteristics of a slinger rammed mold as compared to a jolt squeeze rammed mold? Assuming that the sand is of desirable characteristics, then the principal concern is mold hardness. In order to obtain "true to pattern" castings and a properly vented mold, variation in mold hardness is desired. On a slinger this is obtained by using various diameters and widths of the head. The greater the peripheral speed and the wider the tip the heavier the wad of sand and the greater the force with which it is thrown. This variation in mold hardness can also be obtained by a variable speed motor or by the speed by which the slinger head is moving across the work. It is interesting to note in this case that depth of flask is not so important on a slinger, for a job can be rammed from 2 to 14 ft. with comparable facility. As mentioned before, a mold 14 ft. deep would be a real mold jolt job and in this case the slinger predominates. Mold hard-

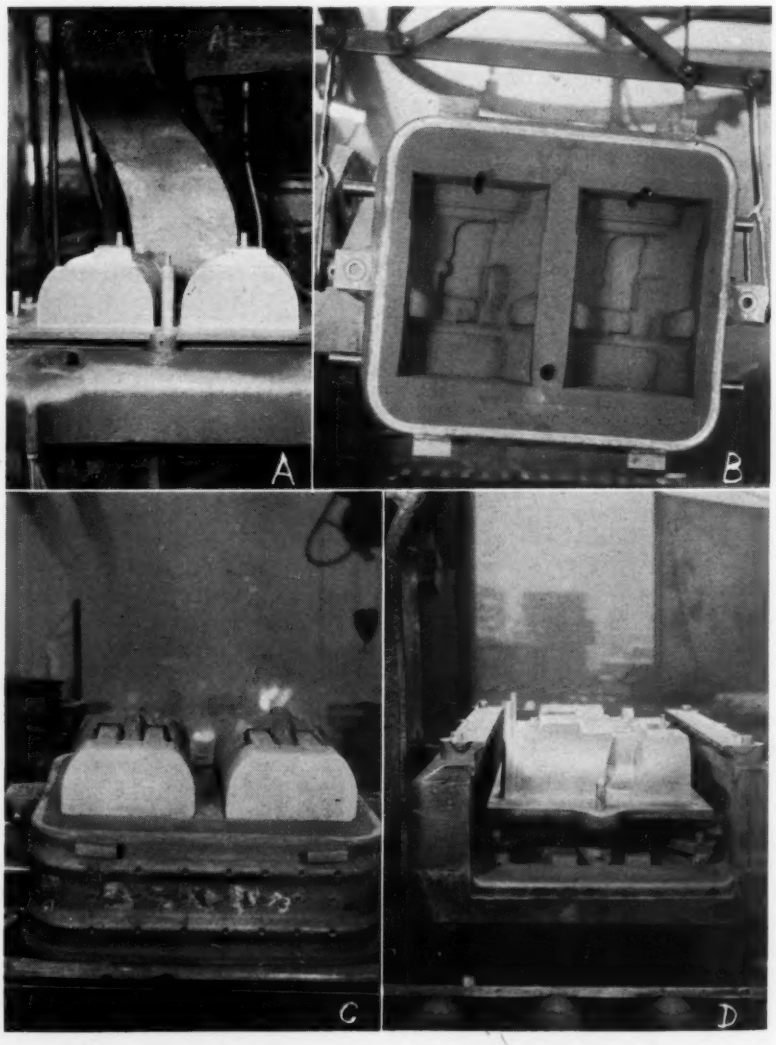


FIG. 6—(A) Flask and machine of Fig. 4 used in producing two cylinders per mold. Note depth of screen sand between cylinders. (B) Cope of pattern ready for closing. (C) Drag mold cored up ready for cope. Note metal section and pocket between cylinders. (D) End view of pattern. Note rugged equipment.

ness by a Dietert gauge can be obtained up to 100 points if desired, and 100 points with a Dietert gauge is about as hard as a pine board.

Mold hardness on a jolting squeeze machine is obtained by two processes—jolt and squeeze. The jolt piston should be large enough to raise the flask, pattern and sand readily. The jolt itself is, of course, obtained by gravity, depending upon the flowability of your sand, moisture content, bond, etc. Fifteen jolts is the most and all that should ever be required. The hardness effected by jolting should be effective for 1/3 the depth of the flask. Normally this should read from 70 to 75 with the Dietert tester. The balance is achieved by the squeeze. The squeeze is fast being recognized as the most important item in the making of this type of mold and should be effective for 2/3 the depth of the flask, which means larger and better squeeze cylinders. A recommended pressure is about 50 lb. per sq. in. of mold area.

Jolting is hard on equipment and a better mold is obtained with just enough jolt to obtain sufficient hardness and the balance obtained by squeeze. A typical mold on a jolt squeeze machine will test from 80 to 90 points on the Dietert tester at the surface next to the pattern. Next to the squeeze board the mold hardness fades away about 10 points between these limits. While 50 lb. is generally considered as sufficient squeeze pressure, recent developments have shown that 80 lb. is making truer to pattern castings. It is the writer's opinion that every piece of equipment involved from

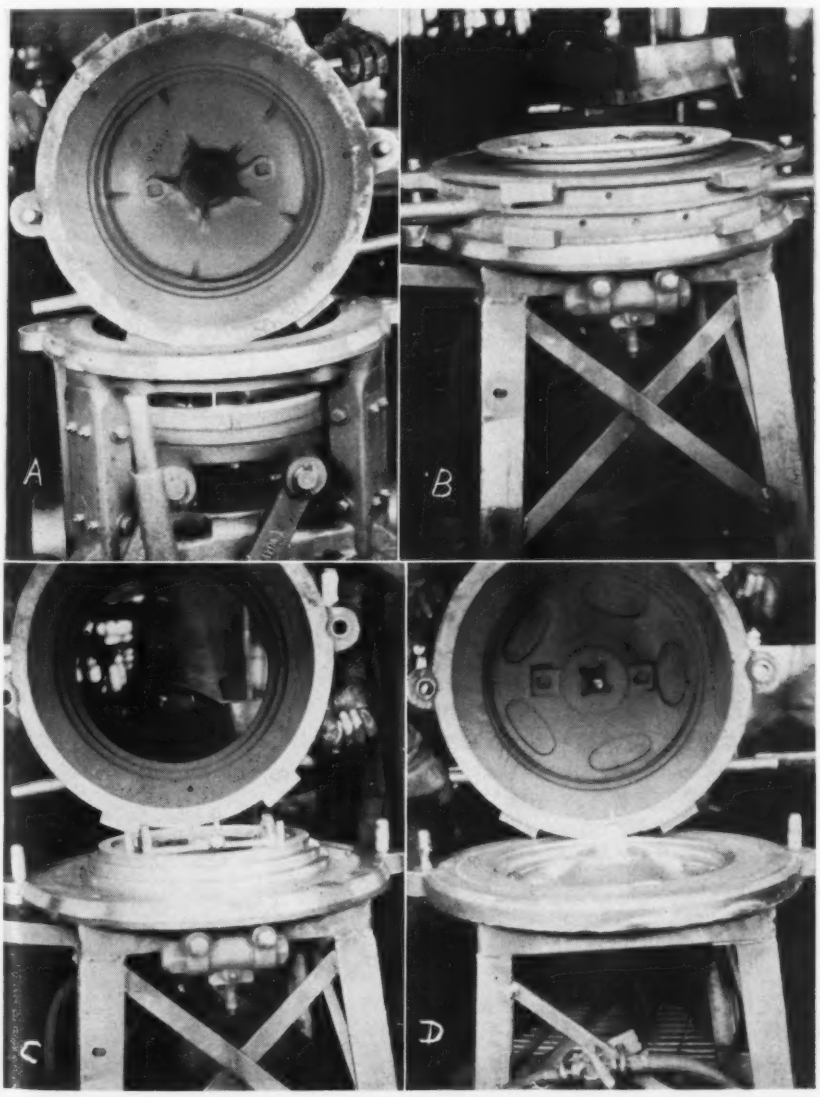


FIG. 7—(A) Drag of three part mold. The finish casting is a front wheel made of high strength iron. (B) Showing cheek which had been slinger rammed with center section of pattern raised ready for lifting out. (C) Cheek ready for setting. Flask has no bars other than sand strip. (D) Cope ready to be assembled.

FIG. 8—Miscellaneous patterns being made on a slinger table producing 720 molds per day.

these two natural methods of molding has its place. The study of your foundry conditions will determine which fits you best.

When a molding unit of either sandslinger or molding machine type is built, service is bought for the molders. No attempt to hold a brief for any particular type of unit, whether gravity conveyor, pallet type, car type, or what not will be made. All of these designs have two main objects: properly conditioned sand and removal of molds from the molder with minimum amount of effort.

Molding Units

There are perhaps a dozen large foundries which are completely mechanized and a hundred or more partially so. Due to changing economic conditions, it becomes almost imperative that our foundries be equipped better and improved from every point-of-view. Improving working and atmospheric conditions, washroom, toilet and production facilities means less lost time. The foundry is becoming a manufacturing unit which operates on an 8 hr. schedule.

However, for the average shop, it is more dangerous to over-equip than it is to under-equip. Over-equipment may lead to loss of your business, while being under-equipped only to loss of business. If a unit is being considered, some successful and unsuccessful unit installations should be visited. As scrap castings are examined for defects, so should other units likewise be examined.

A molding unit may cost from $5,000 to $10,000 per molder. The interest and depreciation on a $10,000 investment are equivalent to a man on the payroll. This man may have no clock number, but he stands at your elbow every day, 5 days per

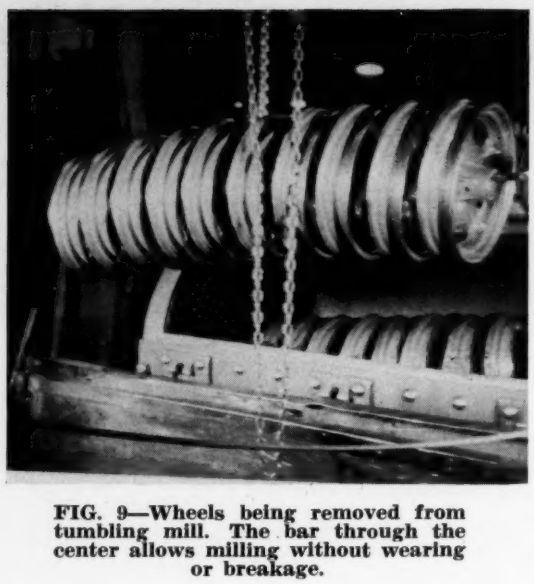


FIG. 9—Wheels being removed from tumbling mill. The bar through the center allows milling without wearing or breakage.

FIG. 10—A sand slinger converted into a sand cutter which has a special screen magnet and aereator attachments. Follows regular slinger shakeout through heap. Two shifts are able to use slinger with better sand conditioning.

week, 52 weeks per year. Be sure you can keep him busy. For the average shop the unit should be designed to be profitable at below normal requirement, and have flexibility enough to operate 24 hrs. per day in high production periods.

Foundrymen have been good trial horses for all types of equipment. How many machines have you in your hope-chest? You hoped to get 100 molds or so per hour and you ended up with thirty. Who is to blame? Are you doing that today? At a meeting of this Association last year, Mr. Hynan of Saginaw Malleable Iron Division of General Motors told *of the difficulty of getting machines made to their requirements. Molding machines had a wide variation in limits and tolerances. Castings could not be held to required dimensions. To make castings with a few thousandths for grinding and 1/16 to 3/32 in. for machine surfaces for lower finish requirements, one must have accurately made, rugged molding machines.

In our plant at Waterloo, we have some 400 patterns in the sand weekly with daily production approximately 35,000 pieces, varying in weight from a few oz. to 800 lb. As four to five models of tractors are run concurrently, with low inventories the problem is one of quick interchangeability. This production problem has been met by side rail drop-plate equipment on molding machines. Pattern changes can be made in 10 min. by this method. Also, a wide variety of work can be made on the same machines. Like the Saginaw Malleable, our first setup was to have stripping plates follow the contour of the pattern itself. This was to overcome inaccuracies of the pattern and molding machine. With better patterns and closer tolerances on molding machines, a large percentage of stripping plates have been eliminated. Also, this method lengthens the life of patterns. Usually one side of a pattern rode the stripping plate and eventually scarred. With the straight side rail a longer bearing is obtained. With the use of the drop-plate sand control is a necessity.

*Pattern Development and Molding Methods, E. T. Hynan, Transactions American Foundrymen's Association, Vol 46 (1938), pp. 811-830.

Transactions Wanted

BOUND volumes of TRANSACTIONS of recent years are proving very popular because of the acknowledged value of the papers which the Association has published. The value of these bound volumes is emphasized by the many requests which have been received for completion of files, especially those volumes issued since 1930. The supply of volume 42 (1934) and volume 44 (1936) is entirely exhausted and as certain special technical library requirements are unfilled, any member having these volumes and desiring to sell them is requested to communicate with the A.F.A. offices.

Northern Calif. Foundrymen's Institute Formed

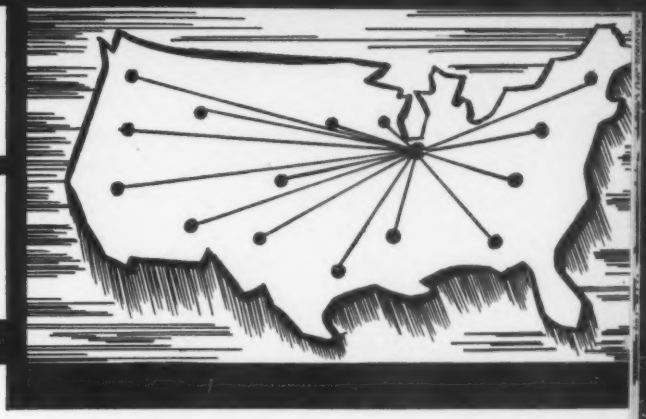
THROUGH George L. Kennard, secretary of the Northern California Chapter, word has been received that a new foundry trade organization for that territory has been organized, this being named the Northern California Foundrymen's Institute. The by-laws of the Institute outline the general purpose as being for the advancement of the industry, unity of action in recommendations as to legislation, motion of high standards of business practice, establishing a uniform cost system, motion of standards of ethics and an increase in the use and sale of castings.

Mr. Kennard, who formerly served as manager of the Pacific Coast Founders' Association, recently disbanded, will serve the new Institute as secretary and will direct his work from 304 Rialto building, San Francisco.

Correction

PATTERN Making for Engineers, by J. G. Conners and P. Gates, 6th Edition, cloth bound, 31 chapters, 390 pages, 558 illustrations, published by the Technical Press, Ltd., 5 Ave Maria Lane, Ludgate Hill, E.C.4, London, England. In the review of this book published in June issue of *American Foundryman* the price listed should have been 15 shillings, net.

Chapter Activities



Northeastern Ohio Discusses Sand Control

By Pat Dwyer,* Cleveland, O.

APPROXIMATELY 250 members and guests of the Northeastern Ohio Chapter, A.F.A., attended the last meeting of the season May 11 at the Cleveland Athletic club to see and hear Harry Dietert, H. W. Dietert & Co., Detroit, demonstrate and explain why sand behaves as it does under the widely varying conditions to which it is subjected in the foundry.

Before the technical meeting started the retiring chairman, L. P. Robinson, Werner G. Smith Co., instructed the secretary to cast a unanimous ballot for the following slate of officers for the coming year as proposed by the nominating committee: Chairman, Ernest F. Hess, Ohio Injector Co., Wadsworth, O.; vice chairman, F. Ray Fleig, Smith Facing & Supply Co., Cleveland; secretary (re-elected), J. H. Tressler, Hickman, Williams & Co., Cleveland; treasurer (re-elected), R. F. Lincoln, Osborn Mfg. Co., Cleveland. Directors for 3-year terms, Leroy P. Robinson, Werner G. Smith Co., Cleveland; Fred A. Stewart, National Malleable & Steel Casting Co., Cleveland, and E. J. Hedlund, Urick Foundry Co., Erie, Pa. Frank L. Barton, Fulton Foundry & Machine Co., Cleveland, was elected director for one-year term.

According to Mr. Dietert the following properties are important in the selection of new sands: Grain size, permeability, clay content, refractoriness, grain distribution, amount of fines, durability, dry strength, amount of objectionable materials, expansion and contraction at a temperature of 2500° F., hot strength at elevated temperatures, deformation or plasticity, grain shape. Each of these factors was taken up in turn, illustrated by charts and running comment and by actual demonstration of quantities of sand passed through the various sand testing and measuring devices.

Touching on the liability to error in the old fashioned feel test he showed two samples of sand, one which felt coarser than the other and therefore apparently presenting higher permeability. Actual test on permeability apparatus showed that the finer sand was 130 while that of the coarser sand was only 40. As a factor in determining permeability the speaker claimed that the amount of sand on three adjacent screens should amount to approximately 75 per cent of the total.

*Engineering Editor, *The Foundry*.

Central New York Chapter Holds Annual Meeting and Discusses Refractories

By L. D. Wright,* Geneva, N. Y.

THE regular monthly meeting of the Central New York Chapter was held May 26 at the Onondaga Hotel, Syracuse. Dinner was served with 75 members and guests in attendance. As this was the last regular meeting of the fiscal year, the annual business meeting was held immediately following the dinner. H. H. Judson, chapter chairman, opened the meeting by submitting his annual report together with a report prepared by the treasurer, reviewing the activities of the chapter and showing receipts and disbursements for the year. These reports were accepted unanimously by the members present and placed on file with the secretary.

Mr. Judson then called on Walter Thomas, chairman of the nominating committee, to present a slate of officers to be voted on for the next fiscal year. Mr. Thomas presented the names of H. H. Judson, Goulds Pumps, Inc., Seneca Falls, for chairman; Frank C. Wheeler, Kimman & Wheeler, Syracuse, for vice chairman; L. D. Wright, U. S. Radiator Corp., Geneva, for secretary, and E. J. Bair, Utica Radiator Corp., Utica, for treasurer. There being no other nominations, the secretary cast the unanimous ballot of all members for the election of the candidates named in the report of the nominating committee.

Leo Lonergan, of the Morris Machine Works and chapter director, then presented the report of the recreation committee and announced that the annual picnic would be held at Three Rivers Inn, Three Rivers Point, N. Y., on August 26. All foundrymen of Central New York and other localities are invited to attend this outing.

Chairman Judson then introduced C. E. Bales, vice president of the Ironton Fire Brick Company, Ironton, Ohio, as speaker of the evening. Mr. Bales presented an illustrated talk on "Refractories for the Iron Foundry"

*Supt., U. S. Radiator Corp., and Secretary Central New York Chapter.

and gave to the members present a comprehensive picture of the materials and manufacturing methods necessary to produce quality refractories.

The speaker stated that the best refractories for the iron foundry are manufactured from hard flint clays. These clays are obtainable in the states of Pennsylvania, Kentucky, and Missouri. By the aid of lantern slides the speaker illustrated to the members the methods used in preparing the clay and the machinery used to form the refractories under a pressure of 1500 lbs. per sq. in. These refractories are then loaded on cars and placed in drying ovens preparatory to being placed in the kilns. In the kilns the refractories are subjected to a temperature of 2400° to 2500° F.

After discussing the subject of formed refractories, Mr. Bales spoke on the use of monolithic linings. As Mr. Bales progressed on the subject of monolithic linings, a great many questions were asked from the floor concerning the mechanical handling of this material. Mr. Bales called upon George S. Evans of the Mathieson Alkali Works, who was present at the meeting, to voice his opinion concerning the use of monolithic linings. Mr. Evans responded by discussing at length the effects of different materials on a monolithic lining and assisted in answering numerous questions asked by the members present.

Before the close of the meeting, Mr. Judson called to the attention of the members the presence of William Hershey, foundry instructor of the Syracuse Vocational Training School, who had brought with him nine members of the student body and was congratulated by the chapter chairman and the other members present for his efforts in promoting the interest of the younger men in the foundry industry.

Mr. Judson closed the meeting by announcing that the next regular meeting would be held on the second Friday in October.

Buffalo Chapter Discusses Modern Foundry Practices

By J. R. Wark*, Buffalo, N. Y.

THE May 1 meeting of the Buffalo Chapter was held in the Washington Room, Hotel Touraine, Buffalo. W. J. Corbett, Atlas Steel Casting Co., chapter vice chairman, officiated in the absence of Chapter Chairman M. W. Pohlman, Pohlman Foundry Co. Mr. Corbett introduced Mr. Mellor of the Socony-Vacuum Oil Co., who briefly described the picture to be shown, "The Inside Story," a very clear talkie movie that gave a complete story of what takes place on the inside of motors and the importance of proper lubrication for all types of bearings. This picture left no doubt in the observers' mind as to what steps to take to care for these types of machines in their own plants.

Mr. Corbett then opened the regular meeting. He announced the Annual Chapter Stag Picnic to be held June 3 at Kudara's Farm. This will include election of officers and directors for the 1939-40 period. Mr. Corbett then introduced H. W. Kelly, foundry engineer, Meehanite Corp., Chicago, who talked on "Modern Developments in Cupola Operation" and the general improvements in general foundry practice. His talk was accompanied with interesting slides depicting these late developments. He also told us of a new idea and predicted the drying of cores by radio beams.

*Queen City Sand & Supply Co., Secretary, Buffalo Chapter.

Museum of Science and Industry to be Scene of Fall Regional Foundry Conference

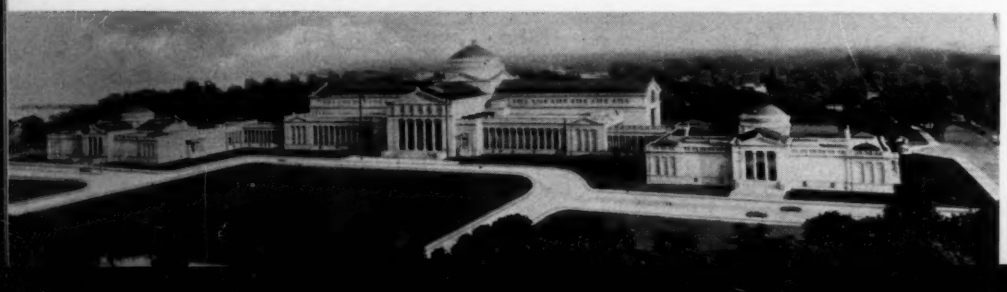
PRELIMINARY plans announced by the Chicago Chapter are for the holding of a three-day regional foundry conference for November 9, 10 and 11. Being arranged for the foundrymen of northern and central Illinois, Indiana and southern Wisconsin, the conference will be held at the Rosenwald Museum of Science and Industry in Jackson Park, Chicago.

The occasion will mark the formal opening of the extensive working foundry exhibit, one of the outstanding exhibits of the many which this world-famous museum will house. The museum building itself as shown in the accompanying illustration is one of the most beautiful buildings in the world, being the main building, left standing from the Columbian Centennial Exposition.

The conference sessions will be so arranged that those attending will have time to view the general exhibits. As the visitor enters through the great bronze doors he will find himself in the great north hall and as he passes under the Central Dome he will note the inscription on it which summarizes the philosophy of the museum: "Science Discerns the Laws of Nature — Industry Applies Them to the Needs of Man."

Ahead in the South Hall is the huge head frame and hoist of the coal mine, the frame of the petroleum drilling rig and related

Museum of Science and Industry where Chicago Chapter Fall Regional Foundry Conference will be held.



exhibits. Passing through the petroleum exhibits, the visitor next enters the steel room where, among others, is the foundry exhibit. In the East Hall airplanes hang from the ceiling and exhibits on all forms of transportation on land, air and rail can be seen. In the West Hall are the exhibits tracing the evolution of power — muscle, water, wind, steam and electricity. In other sections of the museum are exhibits on physics, chemistry, agriculture, forestry, textiles, printing and the graphic arts, the medical sciences, architecture and communication.

The large auditorium seats 1000 and the smaller 300. Both are equipped with public address systems, air conditioning and adequate stage equipment. These two halls and other smaller lecture rooms are being made available for the conference sessions.

The interior of the museum, as contrasted with its classic Greek exterior, is simply and beautifully finished in a dignified modern manner. The floors and central pillars of the great halls are marble. The periodic table of the chemical elements, the building blocks from which the universe is fashioned forms the central exhibit under the dome.

The foundry exhibit has been developed through the co-operation of a Chicago Chapter committee under the chairmanship of C. E. Westover, Burnside Steel Foundry Co., assisted by W. L. Hartley, Link-Belt Co.; A. C. Christensen, National Engineering Co.; W. R. Bean, Whiting Corp.; H. W. Johnson, Greenlee Foundry Co., and W. Harvey Payne, Pittsburgh Electromelt Furnace Co. The conference committee is under the chairmanship of L. H. Rudesill, Griffin Wheel Co. Details of the program will be announced later.

J. E. Hurst Addresses Birmingham Chapter

By W. O. McMahon,* Birmingham, Ala.

THE regular monthly meeting of the Birmingham Chapter was held at the Tutwiler Hotel, May 12, with a record attendance for this chapter's technical meetings. Chapter chairman C. B. Saunders presiding, called upon Dr. J. T. MacKenzie, American Cast Iron Pipe Co., who first introduced Mr. G. T. Lunt, managing director of the well known British firm, Bradley & Foster, Ltd. Mr. Lunt gave a brief description of his experiences on this, his first trip to this country. Dr. MacKenzie then introduced as speaker of the evening Dr. J. E. Hurst, technical director, Bradley & Foster, Ltd., and of Sheepbridge-Stokes Centrifugal Castings Co., Ltd. Dr. Hurst gave a talk on "The Heat Treatment of Cast Iron," holding the rapt attention of the audience for more than thirty minutes, after which there ensued a general discussion. The discussion brought out many interesting questions with equally interesting replies by Dr. Hurst.

This meeting was the best attended and was considered by those present the most valuable ever held by the chapter, and the chapter expresses its appreciation to Dr. Hurst and his associate, Mr. Lunt, for coming to Birmingham expressly for this meeting. It is our understanding that the honorary degree of doctor of metallurgy, recently conferred on Dr. Hurst, was the second such degree conferred by the University of Sheffield, the other recipient being Dr. Compton, president of the Massachusetts Institute of Technology.

Following the dinner, chairman Saunders called upon the chairman of the nominating committee, T. H. Benners, who presented the report for his committee. This report was accepted and the following nominees declared duly elected:

Chairman: R. C. Harrell, Stockham Pipe Fittings Co.

Vice Chairman: W. O. McMahon, Sloss-Sheffield Steel & Iron Co.

Secretary-Treasurer: J. A. Bowers, American Cast Iron Pipe Co.

Directors:

W. E. Curran, Republic Steel Corp.

R. R. Deas, American Cast Iron Pipe Co.

C. B. Saunders, Tennessee Coal, Iron & R. R. Co.

A. S. Holberg, Alabama Clay Products Co.

H. A. Newbury, Newbury Mfg. Co., Talladega, Ga.

W. L. Roueche, Sr., McWane Cast Iron Pipe Co.

L. N. Shannon, Stockham Pipe Fittings Co.

*Sloss-Sheffield Steel & Iron Co., and Secretary, Birmingham Chapter.

Chicago Chapter Holds Final Meeting of the Year

By L. L. Henkel,* Chicago, Ill.

THE final meeting of the year for the Chicago Chapter held at the Medinah club on June 12 was a busy one. Following the usual dinner, Chapter Chairman L. H. Rudesill called upon R. E. Kennedy who presented to Ivan Tudor, apprentice in the steel foundry of the Continental Roll and Steel Foundry Company, a check for $25.00 as an Association award for winning second place in the national apprentice steel molding contest.

Reports of chapter officers and committee chairmen covering the past year's activities were next presented. These reports were presented as follows: *Treasurer* by C. C. Kawin, C. C. Kawin Co., *Membership* by J. J. Fox, Wisconsin Steel Co.; *Junior Foundrymen* by A. W. Gregg, Whiting Corp.; *Regional Conference* by H. W. Johnson, Northwestern Foundry Co.; *Entertainment* by J. H. Abbott, Hickman, Williams & Co.; *Museum of Science and Industry Foundry Exhibit* by C. E. Westover, Burnside Steel Foundry Co., and *Apprenticeship* by A. L.

*Interlake Iron Corp. and Secretary, Chicago Chapter.

Armantrout, Carnegie - Illinois Steel Corp.

Mr. Rudesill reported for J. D. Burlie, Western Electric Co., and chairman, lecture course committee, remarking that the course had an enrollment of 565, the course covering six lectures and two plant visitations, the latter being to the Wisconsin Steel Co. and the Crane Co. plants. The nominating committee report was then given by H. W. Johnson and accepted, with the officers and directors shown in the chapter directory, page 8, being declared elected. Retiring Chairman Rudesill then introduced the newly elected chairman, C. E. Westover, who then acted as chairman for the rest of the evening.

Mr. Westover's first official act was to introduce Mr. A. Walcher, vice president, American Steel Foundries and an A.F.A. director. Mr. Walcher, on behalf of the chapter, presented to the past chairmen a bronze statuette. Those receiving the statuettes were Donald J. Reese, International Nickel Co., New York, 1934-35; James Thomson, Continental Roll and Steel Foundry Co., East Chicago, 1935-36; L. J. Wise, Chicago Malleable Castings Co., 1936-37; H. W. Johnson, Northwestern Foundry Co., 1937-38; L. H. Rudesill, Griffin Wheel Co., 1938-39.

Mr. Westover then introduced F. N. Williams of the First National Bank of Chicago as the speaker of the evening. Mr. Williams' subject was "Taxation Policies and Economic Consequences." This address was very enlightening, covering not only the methods of our federal taxing bodies, but also the manner in which the money was spent. Today, the government is requiring for its expenditures over 25 per cent of the national income, and to obtain this there are over 175,000 separate local tax bodies. He pointed out that in our present capitalistic system the federal tax policy should encourage rather than deter business activity, but due to certain taxes this stimulus to business has been partly taken away. It was suggested that changes be made so that business would be encouraged. Mr. Williams discussed several features of the "Undistributed Profit Tax," as well as other corporate tax problems and in discussing these items he showed how they operated and the penalties placed upon business. He stated that Congress was recognizing some of these defects and were planning to make some changes and hoped that within the next year changes would be made so as to eliminate our present economic situation. To those of us who did not clearly understand the taxation picture, Mr. Williams certainly brought out some salient facts, which gave everyone something to think about.

Statuettes Were Presented to All Past Chairmen of the Chicago Chapter

Northern California Chapter Holds Annual Business Meeting

By Geo. L. Kennard,* San Francisco, Calif.

THE annual meeting of the Northern California Chapter was held at the Lake Merritt Hotel, Oakland, June 9, with Vice Chairman S. D. Russell presiding. Officers and committees presented reports of their year's activities. Then, in recognition of the service rendered by Chairman Fenstermacher during his term, the chapter had prepared and engraved a fountain pen and pencil set. Due to the unavoidable absence of Mr. Fenstermacher, this set was accepted for him by Mr. Russell.

At this point, Mr. Russell turned the meeting over to C. M. Henderson, who presided during the presentation of the report of the nominating committee. The report presented the following names: Chairman, S. D. Russell, Phoenix Iron Works; vice chairman, I. L. Johnson, Pacific Steel Casting Co.; secretary-treasurer, Geo. L. Kennard, Northern California Foundrymen's Institute; directors to serve two years, John D. Fenstermacher, Columbia Steel Co.; A. W. Allen, San Francisco Stove Works, Harry Bossi, H. C. Macaulay Foundry Co., and F. R. Geis, Metallurgical Laboratories. As there were no other nominations offered the secretary cast the unanimous ballot for the nominees after which acting Chairman Henderson announced all elected by unanimous vote.

Chairman Russell, again presiding, introduced Arthur L. Nelson, Nelson Iron Works, as chairman of the pattern making committee of the chapter, who spoke extemporaneously on the subject, "The Patternmakers' Relation to Castings," after which he introduced Richard Vosbrink, president, Berkeley Iron Works, who gave an exceedingly interesting talk on the importance of pattern makers' art from ancient to modern castings. As a concluding feature, the U. S. Steel sound movie on "Making and Shaping of Steels" was shown.

Before the meeting closed, past chairman Chas. Hoehn, Enterprise Foundry Co., proposed in the form of a motion that the chapter sponsor an A.F.A. day at the Golden Gate International Exposition. This motion was carried, the date being fixed as September 9.

*Secretary, Northern California Foundrymen's Institute and Northern California Chapter.

Cincinnati District Chapter Combines Outing and Meeting

By E. T. Korten,* Cincinnati, O.

THE first outing of the Cincinnati District Chapter was held at the "Pines," a picnic grounds on the western hills of Cincinnati. Golfers were accommodated at the Western Hills Country club. In the afternoon a hotly contested softball game was enjoyed by both players and spectators. We enjoyed a chicken dinner at 7 o'clock which was followed by presentation of prizes to the worst golfers, captains of both ball teams, inasmuch as it was a coincidence that the scorekeepers reported a tie score. Prizes were also given to the man who came the longest distance to the meeting, the father of the largest family and the best dressed man.

The election of officers and directors was then held and while the tellers counted the ballots, John Merz, an apprentice of the Cincinnati Milling Machine Company was presented with a check from the national office as a reward for his winning second place in the national apprentice pattern making contest. All the officers and directors were re-elected.

Leroy P. Robinson, Werner G. Smith Company, Cleveland, was then introduced as the speaker of the evening. He recounted in his well-known, humorous manner, his experiences in operating as a sideline a poultry farm in Michigan. This talk was enjoyed by all.

*Reliable Pattern & Castings Co. and Secretary, Cincinnati District Chapter.

N. I.-S. W. Picnics at Svithod Park

ON Saturday, June 10, the Northern Illinois-Southern Wisconsin Chapter held its annual outing for members and foundry friends at the very pleasant outing place, Svithod Park, a Swedish club on the beautiful Rock River near Rockford, Ill.

With an attendance of around 200 the members enjoyed the day with games, eating and friendly conversation. The golfers spent the morning at the Forest Hills club, going to the park for a smorgasbord luncheon. A more formal dinner was held in the evening.

St. Louis Chapter Holds Picnic

A TERRIFIC rain storm dampened but did not deter a record attendance at the annual picnic outing of the St. Louis Chapter. This outing was held at Joe Davies' Ferguson Country club, Saturday, June 10. Games of all kinds, indoor and outdoor, were a feature of the day. An orchestra entertained during the afternoon.

There was an abundant supply of barbecue, sausage, potato salad and other eatables washed down with an abundance of St. Louis beer. An exceptionally enjoyable time was had by all of the 150 who took part.

Quad City Chapter Outing

THE Quad City Chapter, A.F.A., held its annual outing with a picnic at Eagles Country Home on the Rock River, Moline, with the golfers playing at Short Hills Country club. This proved to be a very suitable and enjoyable closing session of the year's program for some 125 who were present. A chicken and fish dinner was served in good old country style during the latter part of the afternoon. Sports, games and the usual "get-togethers" with refreshments were in evidence all during the afternoon to the music of Jimmie O'Dette and his accordion. Prizes for those in attendance and those playing golf were given out during the afternoon.

There were many guests from other chapters in attendance at

The candid camera at the N. I.-S. W. Outing. (Photos, Courtesy John Bing.)

Quad City Chapter Has Great Time at Outing.

this outing, there being several from Chicago, St. Louis, Rockford, Waterloo, and many other places.

This annual affair was held on Saturday, June 17, under the direction of the picnic committee with John H. Ploehn as chairman.

Apprentice Contest Winners

On this page are shown the pictures of several of the winners in the annual pattern making and molding apprentice contest held at the Cincinnati convention. Pictures of other winners announced last month will be shown in forthcoming issues. Those shown here are: George Gedeon, Cleveland Trade School, 1st prize in pattern making; John Merz, Cincinnati Milling Machine Co., 2nd prize in pattern making; George W. Wert, Birdsboro Steel Foundry and Machine Co., 3rd prize in pattern making; Lewis W. Greenslade, Jr., Brown & Sharpe Mfg. Co., 1st prize in gray iron molding, and Ivan Tudor, Continental Roll & Steel Foundry Co., 2nd prize in steel molding.

George Gedeon.

British Foundrymen Honor Dr. Schwartz

DURING the International Foundry Congress, held in London, June 12 to 16, the Institute of British Foundrymen, hosts to the Congress, signally honored a member of the American Foundrymen's Association.

Dr. H. A. Swartz.

To Dr. Harry A. Schwartz, manager of research, National Malleable & Steel Castings Co., Cleveland, Ohio, the institute awarded the E. J. Fox Gold Medal in recognition of the very valuable work he has done in research developments in the field of malleable iron. The award was first announced in this country by a past President of the Institute, Dr. J. E. Hurst, at the time of the annual convention of the A.F.A. in Cincinnati.

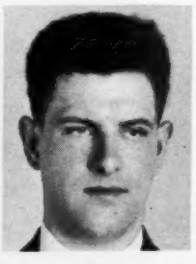
The medal was established a few years ago by E. J. Fox, managing director, Stanton Iron Works Co., Ltd., and its establishment commemorated the development of centrifugal castings in Great Britain. Previous recipients of the medal are Thomas Turner, Professor Emeritus, University of Sheffield, and J. E. Hurst, Technical Director, Bradley & Foster Co., Ltd., England.

F. A. Melmoth.

In 1930, Dr. Schwartz was awarded the John A. Penton Gold Medal of the A.F.A.

The two official delegates of the A.F.A. to the Congress were Dr. Schwartz and Past President W. R. Bean, Whiting Corp., Harvey, Ill. The official exchange paper of the A.F.A. was prepared by Frederick A. Melmoth, Vice President, Detroit Steel Castings Co., and was entitled "The Renaissance of the Steel Casting and the Role of the Metallurgist." Mr. Melmoth, a native of England, has made an outstanding name for himself since coming to the U. S. A., being prominent in the work of the A.F.A.

George W. Wert.



Lewis W. Greenslade, Jr.

Ivan Tudor.

John Merz.

Chapter Directory

Chicago Chapter

Meetings—2nd Monday, monthly, Medinah Club of Chicago.
Chairman—C. E. Westover, Burnside Steel Foundry Co.
Vice-Chairman—G. P. Phillips, International Harvester Co.
Secretary—L. L. Henkel, Interlake Iron Corp.
Treasurer—C. C. Kawin, C. C. Kawin Co.
Directors—J. D. Burlie, Western Electric Co.
W. H. Parker, American Steel Foundries.
J. J. Fox, Wisconsin Steel Co.
L. J. Wise, Chicago Malleable Castings Co.
H. Kenneth Briggs, Western Foundry Co.
H. W. Johnson, Greenlee Foundry Co.
A. W. Gregg, Whiting Corp.
W. C. Packard, National Engineering Co.
B. J. Aamodt, National Malleable & Steel Casting Co.
J. H. Abbott, Hickman, Williams & Co.
L. F. Lottier, Peoples Gas, Light & Coke Co.
L. H. Rudesill, Griffin Wheel Co.

Northeastern Ohio Chapter

Meetings—2nd Thursday, monthly, Cleveland Club, Cleveland.
Chairman—E. F. Hess, Ohio Injector Co., Wadsworth.
Vice-Chairman—F. Ray Fleig, Smith Facing & Supply Co.
Secretary—J. H. Tressler, Hickman, Williams & Co.
Treasurer—R. F. Lincoln, Osborn Mfg. Co.
Directors—Frank L. Barton, Fulton Foundry & Machine Co.
E. J. Hedlund, Urick Foundry Co., Erie, Pa.
D. J. McAvoy, Grabler Mfg. Co.
B. G. Parker, Youngstown Foundry & Machine Co., Youngstown.
Marcel Reymann, Atlantic Foundry Co., Akron.
L. P. Robinson, Werner G. Smith Co.
S. P. Schloss, Superior Foundry Co.
Frank G. Steinebach, "The Foundry."
F. A. Stewart, National Malleable & Steel Castings Co.

Quad City Chapter

Meetings—3rd Monday, monthly, rotate between Davenport, Iowa; Moline, East Moline and Rock Island, Ill.
Chairman—Horace Deane, Deere & Co., Moline, Ill.
Vice-Chairman—Herman Alex, Rock Island Arsenal, Rock Island, Ill.
Secretary-Treasurer—J. Morgan Johnson, Tri-City Manufacturers' Association, Moline, Ill.
Directors—M. J. Gregory, Caterpillar Tractor Co., Peoria
P. T. Bancroft, Moline.
L. W. Starner, Frank Foundries Corp., Moline
Nathan Lesser, Deere & Co., Moline.
L. E. Roby, Jr., Peoria Malleable Castings Co., Peoria.
E. C. Wussow, Williams-White & Co., Moline.
Ray Wendland, International Harvester Co., Rock Island.
Frank W. Wells, J. I. Case Co., Rock Island.
Earl Snoddy, Blackhawk Foundry & Machine Co., Davenport, Iowa.

Detroit Chapter

Meetings—3rd Thursday, monthly, Fort Shelby Hotel, Detroit.
Chairman—Harry W. Dietert, Harry W. Dietert Co.
Vice-Chairman—J. H. Crawley, Pontiac Motor Co.
Secretary—H. J. Deutsch, Aluminum Co. of America.
Treasurer—Wm. W. Bowring, F. B. Stevens, Inc.
Directors—Ira F. Cheney, Griffin Wheel Co.
V. A. Crosby, Climax Molybdenum Co.
Howard McCoy, Cadillac Motor Car Co.
R. G. McElwee, Vanadium Corp.
A. L. Boegehold, General Motors Research Labs.
R. B. Crawford, Atlas Foundry Co.
F. A. Melmoth, Detroit Steel Casting Co.
Fred Walls, International Nickel Co.
Glenn Coley, Detroit-Edison Co.
Otto E. Goudy, Kelsey-Hayes Wheel Co.
L. G. Korte, Riley Stoker Corp.
E. L. Morrison, Budd Wheel Co.

St. Louis District Chapter.

Meetings — 2nd Thursday, monthly, York Hotel, St. Louis.
Chairman—L. E. Everett, Key Co., East St. Louis, Ill.
Vice Chairman — W. Carter Bliss, Scullin Steel Co., St. Louis.
Secretary-Treasurer—J. W. Kelin, Federated Metals Div., American Smelting & Refining Co., St. Louis.
Directors—L. Desparois, Pickands, Mather & Co.
G. S. Haley, Century Foundry Co.
George Mitsch, American Car & Foundry Co.
L. Reiber, United Collieries.
C. H. Morken, Carondelet Foundry Co.
L. C. Farquhar, American Steel Foundries, Granite City, Ill.
A. O. Nilles, Griffin Wheel Co., N. Kansas City.
Webb Kammerer, Midvale Mining & Mfg. Co.
L. J. Filstead, John C. Kupferle Foundry Co.
H. Sanders, American Foundry & Mfg. Co.
C. E. Rothweiler, Hickman, Williams & Co.

Metropolitan Philadelphia Chapter

Meetings—2nd Friday, monthly, Engineers' Club, Philadelphia.
Chairman—H. L. Henszey, The Carborundum Co., Philadelphia.
Vice-Chairman—W. C. Hartmann, Bethlehem Steel Co., Bethlehem, Pa.
Secretary-Treasurer—W. B. Coleman, W. B. Coleman & Co., 1920 W. Indiana Ave., Philadelphia.
Directors—C. A. Bever, Bethlehem Steel Co., Bethlehem, Pa.
J. T. Fegley, North Bros. Mfg. Co.
G. L. Coppage, Pusey & Jones Corp., Wilmington, Del.
L. W. Harris, Link-Belt Co.
R. J. Keeley, Ajax Metal Co.
John H. S. Spencer, H. W. Butterworth & Sons Co., Bethayres, Mont Co., Pa.

Wisconsin Chapter

Meetings—3rd Friday, monthly, Schroeder Hotel, Milwaukee.
President—W. J. MacNeill, Federal Malleable Corp., West Allis.
Vice-President—B. D. Claffey, General Malleable Corp., Waukesha.
Secretary—A. C. Ziebell, Universal Foundry Co., Oshkosh.
Treasurer—M. J. Carpenter, Carpenter Brothers, Inc.
Directors—Roy M. Jacobs, Standard Brass Works.
Ray Flansburg, Belle City Malleable Iron Co., Racine.
Harry Donald, Interstate Supply & Equipment Co.
A. F. Genthe, Harnischfeger Corp.
R. S. MacPherran, Allis-Chalmers Mfg. Co., West Allis
E. L. Roth, Motor Castings Co.
T. E. Ward, Badger Malleable & Mfg. Co.

Northern California Chapter

Meetings—2nd Friday, monthly.
Chairman — S. D. Russell, Phoenix Iron Works, Oakland
Vice Chairman—I. L. Johnson, Pacific Steel Castings Co., Berkeley.
Secretary-Treasurer—G. L. Kennard, Northern California Foundrymen's Institute, San Francisco.
Directors—J. K. Benedict, H. C. Donaldson Co., San Francisco.
Harold Martin, Vulcan Foundry Co., Oakland.
M. M. Morison, Balfour Guthrie & Co., Ltd., San Francisco.
M. G. Wilson, Wilson & Nutwell, Fresno.
J. D. Fenstermacher, Columbia Steel Co., San Francisco.
A. W. Allen, San Francisco Stove Works, San Francisco.
H. A. Bossi, H. C. Macaulay Foundry Co., Berkeley.
F. R. Geis, Metallurgical Laboratories, San Francisco.

Birmingham Chapter

Meetings—3rd Friday, monthly, Tutwiler Hotel, Birmingham.
Chairman—R. C. Harrell, Stockham Pipe Fittings Co.
Vice-Chairman—W. O. McMahon, Sloss-Sheffield Steel & Iron Co.
Secretary-Treasurer—J. A. Bowers, American Cast Iron Pipe Co.
Directors—W. E. Curran, Republic Steel Corp.
R. R. Deas, Jr., American Cast Iron Pipe Co.
C. B. Saunders, Tennessee Coal, Iron & R. R. Co.
A. S. Holberg, Alabama Clay Products Co.
H. A. Newbury, Newbury Mfg. Co., Talladega, Ga.
W. L. Roueche, Sr., McWane Cast Iron Pipe Co.
L. N. Shannon, Stockham Pipe Fittings Co.
R. K. Durkan, M. W. Warren Coke Co.

Buffalo Chapter

Meetings—1st Monday, monthly.
Chairman—W. J. Corbett, Atlas Steel Casting Co.
Vice-Chairman—John McCallum, McCallum-Hatch Bronze Co.
Secretary—J. R. Wark, Queen City Sand & Supply Co.
Treasurer—R. K. Glass, Republic Steel Corp.
Directors—Alex Rankin, Lake Erie Engineering Corp.
Jos. Mayer, Lumen Bearing Co.
M. W. Pohlman, Pohlman Foundry Co.
W. S. Miller, C. C. Kawin Co.
R. T. Rycroft, Jewell Alloy & Malleable Co.
V. M. Mazurie, Buffalo Foundry & Machine Co.
J. P. Begley, Pratt & Lechtworth Co.

Southern California Chapter

Meetings—4th Thursday, monthly.
Chairman—A. G. Zima, International Nickel Co.
Vice-Chairman—Jas. E. Eppley, Kinney Iron Works.
Secretary—W. F. Haggman, Foundry Specialties Co., Huntington Park.
Treasurer—Charles R. Gregg, Reliance Regulator Corp., Alhambra.
Directors—R. J. Crichton, American Brake Shoe & Foundry Co.
Pasquale Arpea, Axelson Mfg. Co.
J. G. Eberhart, Kay-Brunner Steel Products, Inc.
Thomas J. McGraw, Jas. E. McGraw & Son, Brea.
J. E. Wilson, Climax Molybdenum Co.
Wm. Feltes, Westlectric Castings, Inc.
Silas R. Kimberly, Los Angeles Steel Casting Co.
D. E. Lingenfelter, Quality Foundry & Mfg. Co.
J. G. Coffman, Los Angeles Steel Casting Co.

Metropolitan New York-New Jersey Chapter

Meetings—1st Monday, monthly, Essex House, Newark, N. J.
Chairman—W. E. Day, Jr., Mack Mfg. Co., New Brunswick, N. J.
Vice-Chairman—R. J. Allen, Worthington Pump & Machinery Co., Harrison, N. J.
Secretary—W. A. Phair, "The Iron Age," New York City.
Treasurer—Samuel Frankel, H. Kramer & Co., New York City.
Directors—George Hochgesang, American Brake Shoe & Foundry Co., Mahwah, N. J.
T. D. Parker, Climax Molybdenum Co., New York City.
D. J. Reese, International Nickel Co., New York City.
J. W. Reid, Robins Conveying Belt Co., Passaic, N. J.
Sam Tour, Lucius Pitkin, Inc., New York City.
R. A. Gezelius, Taylor-Wharton Iron & Steel Co., High Bridge, N. J.
R. E. Nesbitt, Pratt Institute, Brooklyn.
J. P. Nevin, Otis Elevator Co., Yonkers.
W. G. Reichert, Singer Mfg. Co., Elizabeth, N. J.
T. J. Wood, American Brake Shoe & Foundry Co., Mahwah, N. J.

Northern Illinois-Southern Wisconsin Chapter

Meetings—2nd Tuesday, monthly, rotating between Rockford and Freeport, Ill., and Beloit, Wis.
Chairman—G. J. Landstrom, Sundstrand Machine Tool Co., Rockford.
Vice-Chairman—P. A. Paulson, Gunite Foundries Corp., Rockford.
Technical Secretary—H. C. Winte, Fairbanks Morse & Co., Beloit, Wis.
Secretary-Treasurer—G. K. Minert, Gunite Foundries Corp., Rockford.
Directors—August Christen, Arcade Mfg. Co., Freeport.
A. W. Wiegert, Geo. D. Roper Corp., Rockford.
W. L. Davey, W. L. Davey Pump Co., Rockford.
H. F. Halverson, Beloit Foundry Co., Beloit, Wis.
C. M. Dale, Liberty Foundries Co., Rockford.
Eli Johnson, Greenlee Bros. & Co., Rockford.
Harry J. Wade, Fairbanks Morse & Co., Beloit, Wis.
John T. Clausen, Greenlee Bros. & Co., Rockford.

Ontario Chapter

Meetings—3rd Friday, monthly.
Chairman—D. J. Macdonald, Dominion Radiator & Boiler Co., Ltd., Toronto.
Vice-Chairman—D. M. Storie, Fittings Ltd., Oshawa.
Secretary-Treasurer—S. R. Francis, Metals & Alloys, Ltd., Toronto.
Directors—Joseph Sully, Sully Brass Foundry, Toronto.
O. W. Eilis, Ontario Research Foundation, Toronto.
W. R. Barnes, W. R. Barnes & Co., Hamilton.
N. B. Clarke, F. B. Stevens, Inc., Toronto.
J. J. McFadyen, Galt Malleable Iron Co., Galt.
John Thwaites, Beatty Bros. Ltd., Fergus.
J. W. Hall, Fahralloy, Ltd., Orilla.
John Reid, Canadian Westinghouse Co., Ltd. Hamilton.

Michiana Chapter

Meetings—Tuesday following 2nd Monday, monthly, Hotel Oliver, South Bend.
Chairman—A. C. Arbogast, Northern Indiana Brass Co., Elkhart.
Vice-Chairman—M. F. Doty, Clark Equipment Co., Buchanan, Mich.
Secretary-Treasurer—L. L. Andrus, American Foundry Equipment Co., Mishawaka.
Directors—W. A. Bachman, New York Central Railroad, Elkhart.
E. C. Bumke, Oliver Farm Equipment Co., South Bend.
A. H. Fries, Peru Foundry Co., Peru.
W. R. Gilmore, Superior Steel & Malleable Castings Co., Benton Harbor.
H. Klouman, Michiana Products Corp., Michigan City.
E. G. Mahin, University of Notre Dame, Notre Dame.
R. J. McSherry, Studebaker Corp., South Bend.
O. A. Pfaff, American Foundry Equipment Co., Mishawaka.
A. J. Rumely, LaPorte Foundry Co., LaPorte.
W. A. Schlosser, Argos Foundry Co., Plymouth.
George E. Stoll, Bendix Products Corp., South Bend.

Central New York Chapter

Meetings—2nd Friday, monthly, Hotel Onondaga, Syracuse.
Chairman—H. H. Judson, Goulds Pumps, Inc., Seneca Falls.
Vice-Chairman—Frank C. Wheeler, Kimman & Wheeler, Syracuse.
Secretary—L. D. Wright, U. S. Radiator Corp., Geneva.
Treasurer—E. J. Bair, Utica Radiator Corp., Utica.
Directors—A. C. Davis, Cornell University, Ithaca.
L. E. Hall, Syracuse Chilled Plow Co., Syracuse.
J. J. Jardine, Caldwell & Ward Brass Foundry, Syracuse.
J. L. Lonergan, Morris Machine Works, Baldwinsville.
G. M. Thrasher, R. Lavin & Sons, Elmira.
W. Jones, International Heater Co., Utica.
F. F. Shortsleeve, Elmira.
N. H. Boardman, Elmira Foundry Co., Elmira.
J. W. Barker, Andes Range & Furnace Corp., Geneva.

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Chester Peebles, Stedman's Foundry & Machine Works, Aurora, Ind.
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Schmieg Sheet Metal Works, Detroit Mich. (John D. Schmieg, Partner)

United States Pipe & Foundry Co., Chattanooga, Tenn. (David Giles, Ass't. Resident Mgr.)

Utica Steam Engine & Boiler Works, Utica, N. Y. (Louis Gaetano)

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E. J. Bothwell, Sales Engr., International Nickel Co., New York, N. Y.

A. J. Bullock, Burbank, Calif.

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R. S. Davis, Ass't. Mgr., National Malleable & Steel Castings Co., Indianapolis, Ind.

Harold H. Dawson, Research Engr., Ohio State University, Columbus, Ohio

Fred A. Dencer, Mgr., Ingersoll-Rand Co., Cincinnati, Ohio

Leo P. Fedegan, Foundry Supt., International Harvester Co., Auburn, N. Y.

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B. E. Gavin, Plant Engr., National Malleable & Steel Castings Co., Indianapolis, Ind.

Alcide Goulet, Supervisor, International Harvester Co., Rock Island, Ill.

Roger Hageboeck, Frank Foundries Corp, Moline, Ill.

George Henning, Jr., Vice-President, Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.

E. G. Jennings, Metallurgist, Canadian Bronze Co., Limited, Montreal, Que., Canada.

Ralph J. Kraut, President, Kaukauna Machine Corp., Kaukauna, Wis.

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Telfer E. Norman, Met. Engr., Climax Molybdenum Co., Climax, Colo.

Howard Phillips, Supv., International Harvester Co., Rock Island, Ill.

Harold M. Poole, Instructor, Dept. of Industrial Engineering, Ohio State University, Columbus, Ohio

Alex Rankin, Fdry. Supt., Lake Erie Engineering Corp., Kenmore, N. Y.

Louis G. Robinson, Louis G. Robinson Laboratories, Cincinnati, Ohio

Harold Rogers, Supv., International Harvester Co., Rock Island, Ill.

W. V. Ross, General Finishing Foreman, National Malleable & Steel Castings Co., Indianapolis, Ind.

Ralph N. Schaper, Sand Technologist, Lebanon Steel Foundry, Lebanon, Pa.

F. A. Schmieg, Partner, Schmieg Sheet Metal Works, Detroit, Mich.

William C. Schulte, Ass't. Prof. Mech. Engineering, Rutgers University, New Brunswick, N. J.

W. F. Schupp, Salesman, Republic Steel Corp., Cincinnati, Ohio

Paul J. Shipe, Chemist, Ohio State University, Columbus, Ohio

Clee Shy, Fdry. Foreman, Banner Iron Works, St. Louis, Mo.

J. B. Skelly, Sales, Hines Flask Co., Cleveland, Ohio

Earl Snoddy, Blackhawk Fdry. & Mach. Co., Davenport, Iowa

Harold Sohner, Metallurgist, International Harvester Co., Rock Island, Ill.

Milton H. Steel, General Manager, Sweets Foundry, Johnson City, N. Y.

J. B. Waters, Sales Rep., Vanadium Corporation of America, New York, N. Y.

Ray H. Wendland, General Supv., International Harvester Co., Rock Island, Ill.

Harold D. Werner, Engineer, Erie Malleable Iron Co., Erie, Pa.

William H. Whittington, The Duriron Co., Inc., Dayton, Ohio

Shirley York, Fdry. Supt., National Malleable & Steel Castings Co., Indianapolis, Ind.

Glenn S. Young, Industrial Engr., Kansas City Power & Light Co., Kansas City, Mo.

Walter A. Zeis, Sales Mgr., Midwest Foundry Supply Co., Edwardsville, Ill.

Wm. Zeunik, Metallurgist, National Malleable & Steel Castings Co., Indianapolis, Ind.

Foreign Members

William Jessop & Sons, Limited, Brightside Works, Sheffield, England

Abstracts

Note: **The following references to articles dealing with the many phases of the foundry industry, have been prepared by the staff of *American Foundryman,* from current technical and trade publications.**

When copies of the complete articles are desired, photostat copies may be obtained from the Engineering Societies Library, 29 W. 39th Street, New York, N. Y.

Cast Iron

CYLINDERS. *"Some Jobbing Problems,"* by F. G. Jackson, *Foundry Trade Journal,* vol. 60, No. 1189, June 1, 1939, pp. 440-441. The author discusses some of the problems encountered in the production of hydraulic cylinders and rams, and of small pump castings made of austenetic cast iron. In the production of hydraulic work such problems as how work is to be cast, temperature of pouring, method of holding in position, etc., are discussed. In the production of small castings such problems as type of melting unit, type of iron, temperature of metal, method of feeding, etc., are described in general. (C.I.)

ELASTICITY. *"Elastic Properties of Cast Iron,"* by A. I. Krynitsky and C. M. Saeger, Jr. *Journal of Research of the National Bureau of Standards,* vol 22, research paper RP1176, February, 1939, pp. 191-207. An optical method for measuring the deflection of cast iron, transverse-test bars during loading up to the breaking strength has been developed. Transverse-strength properties were determined on test bars made from three types of cast iron heated to a maximum temperature of 1400°, 1500°, 1600°, and 1700°C. (2552°, 2732°, 2912°, and 3092°F.) Test bars were vertically cast bottom-poured in greensand molds at 100°, 150°, 200°, and 250°C. (212°, 302°, 392°, and 482°F.) above the liquidus temperature. Total, plastic and elastic deflection; modulus of rupture, modulus of relative elasticity; and total, plastic and elastic resilience were determined and the microstructure of the test bars was examined. (C.I.)

Coke and Coal

ANALYSIS. *"Methods of Analyzing Coal and Coke,"* by F. M. Stanton, A. C. Fieldner and W. A. Selvig, *Bureau of Mines,* Technical Paper 8, 1938 edition, pp. 1-59. This paper, first published in January, 1912, was revised and enlarged in the edition of June, 1913, to include more detailed information concerning the sampling and analytical methods then used by the Bureau of Mines. The revised editions of 1926 and 1929 incorporated various improvements and modifications in laboratory procedures that had been made in the existing methods as well as a number of additional methods. The present revision includes some changes in the various analytical procedures as given in the 1929 edition and, in addition, methods for the determination of sulphur forms and of carbon dioxide in coal, the agglomeration index of coal and iron forms in coal and coke ashes. The paper in its present form is of value to all persons interested in the analysis of coal and coke. (A.)

Cupolas

OPERATION. *"Cupola Control,"* by H. P. Hughes, *Foundry Trade Journal,* vol 60, No. 1187, May 18, 1939, pp. 399-402. The purpose of this paper is to set out some principles which will assist in the mastery of the cupola; this, it is suggested will only be obtained when a recognized system of control is in operation. In describing the importance of control the author divides his paper into the following important factors: Preparing the cupola, charging, air supply, blast pressure, tuyere ratio, air volume, combustion, fuel for combustion, control of pig iron and scrap, limestone, changes in cupola, sulphur, silicon, phosphorus and oxidation. Even though much has been said about this subject, the author by this very practical article adds much to this subject. (F.)

Fuel

GAS. *"Application of Gas Fuel for Foundries,"* by A. E. Wilson, *Foundry Trade Journal,* vol. 60, No. 1188, May 25, 1939, pp. 417-418. This article is an extract from a paper presented before the West Riding of Yorkshire Branch of the Institute of British Foundrymen. Iron Foundries may appear to offer very little scope for gas fuel; there are, however, such jobs as cupola lighting, ladle heating, mold and core drying and skin drying of floor or large molds to which gas may be applied. In discussing mold sand and core drying the author describes how with a specific oven, gases save money. Also cupola lighting, skin drying, ladle heating, oil-sand cores, annealing castings and nonferrous metal melting are described in general. Various photographs illustrating points discussed are included. (Fu.)

Furnaces

DRYING. *"Moisture Due to Combustion and Its Effects on Drying,"* by C. F. Mayer, *Industrial Heating,* vol. 6, No. 6, June, 1939, pp. 535-540, 562. A subject of some discussion in use of fuels for drying ovens is the amount of moisture developed due to combustion. The author uses natural gas as the fuel using the external circulating heating system and core baking as the process. He describes the gases formed, amount of moiture given off by each, amount of moisture sand withholds, the amount of air which unit will circulate and with these facts, explains how and why gas ovens are used for core drying. (F.)

Malleable

HIGH SILICON. *"The Resistance of High Silicon Malleable Iron to Drilling,"* H. A. Schwartz, R. C. Kasper and N. E. Mertz, A. S. T. M. Preprint 36, 1939, pp. 1-2. The machinability of drilling of malleable cast iron ranging from 2.09 to 2.36 per cent carbon and from 1.39 to 2.10 per cent silicon has been determined in the Olsen efficiency machine. Both elements are shown to reduce the resistance to drilling. It is not desired that these data should be interpreted as to the desirability or practicability of making metal of this composition for any particular commercial purpose. The data apply in the absence of primary graphite. This is not to say that such absence always can be relied on. (M.)

NODULE SIZE. *"The Relation of Carbon Nodule Size and Tensile Properties of Malleable Cast Iron,"* H. A. Schwartz, H. J. Schindler and J. F. Elliott, A.S.T.M. Preprint 35, 1939, pp. 1-2. A given white cast iron was converted into malleable irons varying widely in nodule number. It is shown that a great variation in nodule number has little effect on the tensile strength and yield strength but that a small nodule number is favorable to ductility. (M.)

Molding

ACID POT. *"The Art of Molding,"* by J. C. Hallamore, *Foundry Trade Journal,* vol. 60. No. 1188, May 25, 1939, p. 430. The author describes the method of molding an acid pot and a skid wheel for a plough as would be practical in a small foundry where special equipment is not available. With his description are drawings illustrating various points. (Mo.)

COOKING PANS. *"Molding Cast Iron Cooking Pans," Foundry Trade Journal,* vol. 60, No. 1187, May 18, 1939, p. 402. This a short article on the molding of a cast iron pan such as can be used in frying fish or potato chips. The pan described is 20 in. in diameter at the top, 14 in. in diameter at the bottom and 9 in. high. The thickness of the metal ranges from 5/16 to 5/8 in. (Mo.)

STERN TUBE. *"Mold Stern Tube in Roll Flask," The Foundry,* vol. 67, No. 6, June, 1939, pp. 35, 109. The methods of molding a steel stern tube of a tanker is described. No pattern was available, only a sketch with the necessary dimensions was supplied. Briefly, the method may be described as the application of a sweep to form the desired contour of the casting in a body of sand packed in metal casings open at each end. Photographs are given illustrating the various steps. (Mo.)

FUNDAMENTAL FOUNDRY INFORMATION

A Partial List of Available A. F. A. Publications

BOUND VOLUMES OF TRANSACTIONS

Containing a wealth of material in papers and committee reports as presented before annual conventions. At present only 4 of these are available. The supplies are limited, but those which are available are for those most recent conventions when papers and reports have been most numerous and on problems and practices of current importance. These volumes are the foundation of any library of foundry reference books.

Publication No.	Vol.	No. Pages	Price to Members	Price to Non-Members
1	46 (1938)	950	$3.00	$15.00
2	45 (1937)	850	3.00	10.00
4	43 (1935)	722	2.00	6.00
5	41 (1933)	608	2.00	6.00

Publication No. 7

Alloy Cast Irons. 200 pp. 6x9, cloth binding (1939). Price $3.00. To members $1.50.

A committee publication, designed to provide foundrymen, purchasers and potential users with comprehensive and authoritative information on the theory, applications, properties and production of alloy cast irons Sections deal with (1) Metallurgical Theory of Effects of Alloying Elements, (2) Qualitative Effects of Alloys, (3) Quantitative Effects on Properties, (4) White and Chilled Alloy Irons, (5) Heat Treatment, (6) Foundry Practice, (7) Specific Applications, giving analysis, mechanical properties and service results of a wide variety of alloy cast irons used in commercial practice, and (8) Bibliography.

Publication No. 50

The Microscope in Elementary Cast Iron Metallurgy, by R. M. Allen.

143 pp. 6x9 preprint, 73 illustrations, (1939). Cloth binding. Price $3.00. To members $1.50.

A book containing material of lectures presented by the author before 1939 A.F.A. Convention. Designed to meet the needs of the shop man and student in understanding the microstructure of cast iron. Discusses the fundamentals of physical cast iron metallurgy, showing extensive illustration of various types of structures. Outlines effect of forms of graphite, silicon, sulphur, manganese and phosphorus. A chapter is devoted to special cast irons such as white, chilled, malleable, alloy, special duty and heat treated. The chapter on the cast iron equilibrium diagram is easily understood. A major section is a detailed explanation of the microscope and technique of its use, together with the preparations of samples.

Publication No. 31

Steel Castings (A.F.A.-A.S.T.M. Symposium). Heavy paper binding, 254 pp., 6x9, (1932). Price $1.00.

A compilation of ten papers giving critical information and data on the properties of practically all classes of steel castings. Includes data on methods of molding, casting, use of alloys and heat treatment. Design and specifications fully treated. Extensive discussion.

Publication No. 34

Symposium on Malleable Iron Castings 122 pp. 6x9 (1931), Heavy Paper Binding. Price $0.75.

The importance of malleable iron as a material of engineering emphasizes the need of accurate, reliable information upon its manufacture, its properties and other facts of value to the user of the material. This Symposium is published jointly by A.F.A. and A.S.T.M.

Publication No. 36

Design of Straightening Equipment for Malleable Iron Castings, by C. W. Weedfall. 22 pp., 6x9, (1938), 17 illustrations. Price $0.30. To members $0.15.

This paper records the knowledge gained by experience and study on this subject. Some points covered are (1) Causes of warping and deformity, (2) Effects of straightening, (3) Numerous formulas, (4) Factors governing the design of straightening equipment.

Publication No. 56

Symposium on Steel Melting Practice. 84 pp. 6x9 preprint (1939). Heavy paper binding. Price $1.00. To members $0.50.

A compilation of six papers presented before the 1939 Convention, covering melting practices in the acid and basic open-hearth, acid and basic electric furnaces, the induction furnace and the converter shops. The basic open-hearth practice is treated by J. W. Porter, American Steel Foundries, the acid open-hearth by W. C. Harris, Birdsboro Steel Foundry & Machine Co., the basic electric furnace by C. W. Briggs, Steel Founders' Society of America, the acid electric furnace by W. Finster, Reading Steel Castings Div., American Chain & Cable Co., and the induction furnace practice by G. F. Landgraf, Lebanon Steel Foundry. This is the first comprehensive survey of Steel Melting Practices in many years and gives much valuable information to anyone interested in this subject.

Publication No. 57

Synthetic Bonded Steel Molding Sands, by Charles W. Briggs and Robert E. Morey. 51 pp. 6x9 preprint (1939). Price $0.80. To members $0.40.

A comprehensive report of an investigation of a mix consisting of washed silica sand, bentonite and water, in the preparation of synthetic green sands, synthetic dry sands and air dried sands, with excellent properties. The addition of organic binders to green sand is also studied in detail. Extensive correlated abstracts of literature on synthetic sands, bentonites and clay bonding materials.

Non-Ferrous

ANTIMONAL - LEAD. *"Application and Finishing of Antimonal Lead castings,"* by N. Hall, *Foundry Trade Journal,* vol 60, No. 1188, May 25, 1939, p. 428. This article is an extract from Metal Industry of New York. The author discusses the procedure of making antimonal lead castings which serve a field of applications intermediate between that of high-temperature sand or chilled mold castings such as brass, bronze, iron, etc., and zinc, aluminum or magnesium base die-castings. (N.F.)

DENTISTRY. *"Foundry Work in Dentistry,"* G. H. Froggatt, *Foundry Trade Journal,* vol. 60, no. 1181, April 6, 1939, pp. 283, 284, 300. Abstract of a lecture given to the Sheffield Branch of the Institute of British Foundrymen. Foundry work in dentistry is split into two parts. First, the materials used by a dentist in his ordinary practice, such as vulcanisers, flasks, clamps, articulators, and many other articles which are made usually out of yellow brass or gunmetal. The second part can be sub-divided into sections. The first consisting of metal models on which plates, splints, bridges and crowns may be struck or swayed. These are made from such materials as zinc, lead, babbit metal, brass and gunmetal. In the second type the impressions are taken in the usual manner. The pattern covered with wax from which the casting is made. Discussion following presentation of this paper is included. (C.)

PHOSPHORUS BRONZE. *"Many Non-Ferrous Alloys Available,"* by N. K. B. Patch, *The Foundry,* vol. 67, No. 6, June, 1939, pp. 39, 104, 106. This is the sixth of a series of articles by the author on non-ferrous alloys. The alloy described is of the following composition: 79.3 per cent copper, 10 per cent tin, 10 per cent lead, and 0.7 per cent phosphorus. It is a phosphorus bronze deoxidized with an ample amount of phosphorus. It is used essentially as a bearing composition of high order, such as in locomotive and machinery where moderate pressures are the rule. Also described are other alloys of approximately the same composition. These compositions can be found in the May issue of *The Foundry.*

PLATING. *"Plating on Aluminum,"* by W. J. Travers, *The Metal Industry* (London), vol. 54, No. 22, June 2, 1939, pp. 591-592. In ordinary electro-plating on aluminum, the adhesion of the plate is poor. This paper, recently presented before the Electro Chemical Society, describes a new process to which the aluminum surface is submitted to ensure perfect contact. Letters patent have been granted covering the process. (N.F.)

Refractories

LOW WEIGHT. *"Low Weight Furnace Refractories,"* by C. L. Norton, *Canadian Metals and Metallurgical Industries,* vol. 2, No. 5, May, 1939, pp. 112-114. Insulating firebrick may be defined as a refractory product manufactured in standard firebrick shapes, having a low coefficient of thermal conductivity and a bulk density of less than 70 lb. per cu. ft. These bricks can be used directly exposed to the gases of combustion at furnace temperatures up to 1600°C. Most of these bricks are made from what is essentially a fire clay base and differ from ordinary firebrick in their unusually low weight. To discuss the many advantages in making a refractory of high porosity the following physical properties are described: Thermal Conductivity, Hot and Cold Strength, Spalling Resistance, Permeability, Reducing Atmospheres, Melting Point, Slag Attack, Corrosion or Abrasion. (R.)

MORTAR. *"Advantages in the Use of High-Temperature Bonding Mortars,"* by J. A. Patterson, *Information Circular of The American Refractories Institute,* No. 1, May, 1939, pp. 3-7. This paper describes briefly the important properties of high temperature bonding mortar, and to indicate the increased service that can be expected from refractory brick laid with it. The following are accepted as the important and principal properties required for a satisfactory mortar: Refractoriness, constancy of volume, bonding strength, reaction and working properties. Sometimes, the selection of mortars is not given the consideration it should receive and difficulties arise due to improper selection. The wrong kind of joining material can ruin the best brick. (R.)

SEMISILICA BRICK. *"Some Properties of Semisilica Brick,"* by C. B. Remmey, *American Ceramic Society,* vol 22, No. 6, June, 1939, pp. 193-199. The most important differences between semisilica, superduty, first-quality clay, and silica brick are shown by comparative tests. A new 24-hour deformation test is described which measures the rate of deformation of brick at various temperatures. First quality clay bricks are shown to have fairly rapid flow at temperatures as low as 2150°F, and super-duty brick at 2350°F; semisilica brick shows a zero rate of deformation up to 2650°. First-quality clay bricks vitrify and spall at temperatures as low as 2300°F; under similar conditions, semisilica bricks do not vitrify at much higher temperatures. Limitations in the use of semisilica brick are also discussed. (R.)

Safety

PLANT. *"Small Plant Safety,"* by J. H. Vernor, *Safety Engineering,* vol. 77, No. 5, May, 1939, pp. 7-9. The author describes the methods and results of providing a safety program for a small plant. In any safety program there are three essentials involved. (1) Common Sense. (2) Willingness to Learn. (3) Enforcement of Discipline. To bring about a complete and enforceable safety program the safety committee was picked from men in the shop with broad powers which were backed by the management. One of the devices of this commitee was a red tag which was placed on hazardous equipment. This tag read: "Condemned by Safety Committee. The tag must not be removed until repair is made—it must then be returned to the safety committee with the foreman's signature." The date tag was given and the date returned was kept in the records of the safety committee. The results of this safety program was that the author's plant has so far had 3,984,872 man hours free from lost time accidents. (Se.)

Sand

SCABBING. *"Foundry Sands—Causes of Scabbing," Foundry Trade Journal,* vol. 60, No. 1187, May 18, 1939, pp. 406-408. This article is the discussion which followed the paper "Modern Sand Testing" by W. Y. Buchanans. It is an effort to diagnose the cause of scabbing under the most diverse conditions. The discussion was on the following subjects: types of scabs, difference in nomenclature, causes of scabbing, questionable foundation of sand testing, depth of action involved, improving strength properties, changes of section and scabbing, influence of backing sand, functions of a mold assembly, where backing sand is a factor, slow filling and scabbing, steam production contrasted, green-sand mold and backing sand, and "blotting pad" practice. (Sa.)

Steel

DESIGN. *"Cooperation Between Buyers, Sellers of Steel Castings,"* by A. J. Westphal, *Steel,* vol. 104, No. 23, June 5, 1939, pp. 40-41. To obtain full advantage of the numerous possibilities of steel castings, the author points out how cooperation between buyer and seller is most essential if all factors involved are to receive due consideration. Examples are used to illustrate this viewpoint. (S.)

PROBLEMS *"Production Problems in Steel Castings,"* by P. E. McKinney, *The Foundry,* vol. 67, No. 6, June, 1939, pp. 36-38, 110. The author discusses various problems encountered in the production of steel castings such as shrinkage, melting and freezing point, design, physical properties, radiography, welding and treated uniform structures. The author further states that foundrymen should not be prejudiced toward welding, because it offers advantages in castings of intricate design. (S.)

Time and Motion Study

HAND MOTIONS. *"A Study of Simultaneous Symmetrical Hand Motions,"* by R. M. Barnes and M. E. Maindel, *University of Iowa Studies,* New Series No. 370, Bulletin No. 17, April 1, 1939, pp. 3-33. This research was undertaken to evaluate the effect of the angle which the motion paths of the operator's hands make with the plane of the front of the worker's body upon the efficiency with which the worker moves his hands away from and toward his body in a simultaneous, symmetrical fashion.

Two different types of motions were studies: Part 1, where only the terminal points of the motions were fixed by the work place, the operator directing his hand between them along a convenient path. (Such movements as these are made when the worker reaches across the work place for material to bring it toward him to assemble, inspect or perform some operation upon it.); and Part 2, where both the terminal points and the paths between them were fixed by the work place. (Motions such as these are made by operators moving levers on machines. (T.M.)

X-Ray

OPERATION. *"Handling of Industrial X-Ray Film,"* by R. C. Woods, *The Iron Age,* vol. 143, No. 22, June 1, 1939, pp. 35-38. In handling X-Ray films extreme care must be taken or else the film is apt to show some defect which was caused by carelessness. The author discusses certain points that should be kept in mind while developing X-Ray films. Some of these points are: understanding of the process of developing, dust laden atmospheres, contamination of film by fingers, scratching, etc. In using calcium tungstate intensifying screens it should be remembered that they have a lag. That is, after a heavy X-Ray exposure they may continue to flouresce for some minutes. If a fresh film is placed in a cassette immediately after such exposure and then developed, it will be found to bear the flourescent image of the previous radiography. (A.)